

**ENVIRONMENTAL ASSESSMENT
OF THE
OPERATION AND MAINTENANCE
OF**

MANSFIELD HOLLOW LAKE

NATCHAUG RIVER

Thomas River Basin

CHAPLIN, MANSFIELD & WINDHAM, CONNECTICUT

Prepared by



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PREFACE

The purpose of this Environmental Assessment is to provide the basis for evaluation of the environmental impact on the project area due to the routine operation and maintenance of this flood control reservoir. Mansfield Hollow Lake has been operated whenever necessary since it was constructed to prevent or reduce downstream flooding. Maintenance and management of the project, including the recreation facilities, during non-flood periods is also of primary importance. Enhancement of the fish and wildlife resources as well as protection of the environment within and around the reservoir area has been given careful consideration.

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I. PROJECT DESCRIPTION

A. INTRODUCTION

1. Location and Authorization

Mansfield Hollow Lake is located in northeastern Connecticut on the Natchaug River in the Thames River Basin, 5.3 miles above the Natchaug's confluence with the Willimantic River, where the two rivers form the Shetucket River. The Natchaug River drains the west central part of the basin and is one of the three principal tributaries of the Shetucket. The Natchaug flows out of western Windham County and into Mansfield Hollow Lake in the towns of Mansfield, in Tolland County, and Windham, in Windham County. The dam is about 4 miles north of the center of Willimantic, 25 miles east of Hartford and 40 miles west of Providence, Rhode Island.

The dam, reservoir and dikes are elements of the flood protection plan for the Thames River Basin which was approved by the Flood Control Act of 18 August 1941 (Public Law 28, 77th Congress, 1st Session). The development and use of reservoirs for public recreation and other purposes is authorized by the Flood Control Act of 1944 (Public Law 534, 78th Congress, 2nd Session), as amended. The dam was completed in March 1952, at a cost of \$6,447,000.

2. Purpose

The Corps of Engineers comprehensive flood control plan for the Thames River Basin consists of six active reservoirs and one local protection project. As part of this program, the operation of Mansfield

Hollow Lake provides flood protection primarily to Willimantic, Connecticut, but also to Norwich and other communities along the Shetucket River. This project also offers recreational opportunities compatible with the primary function of flood control.

B. STRUCTURES AND RESERVOIR

1. Dam and Appurtenant Structures

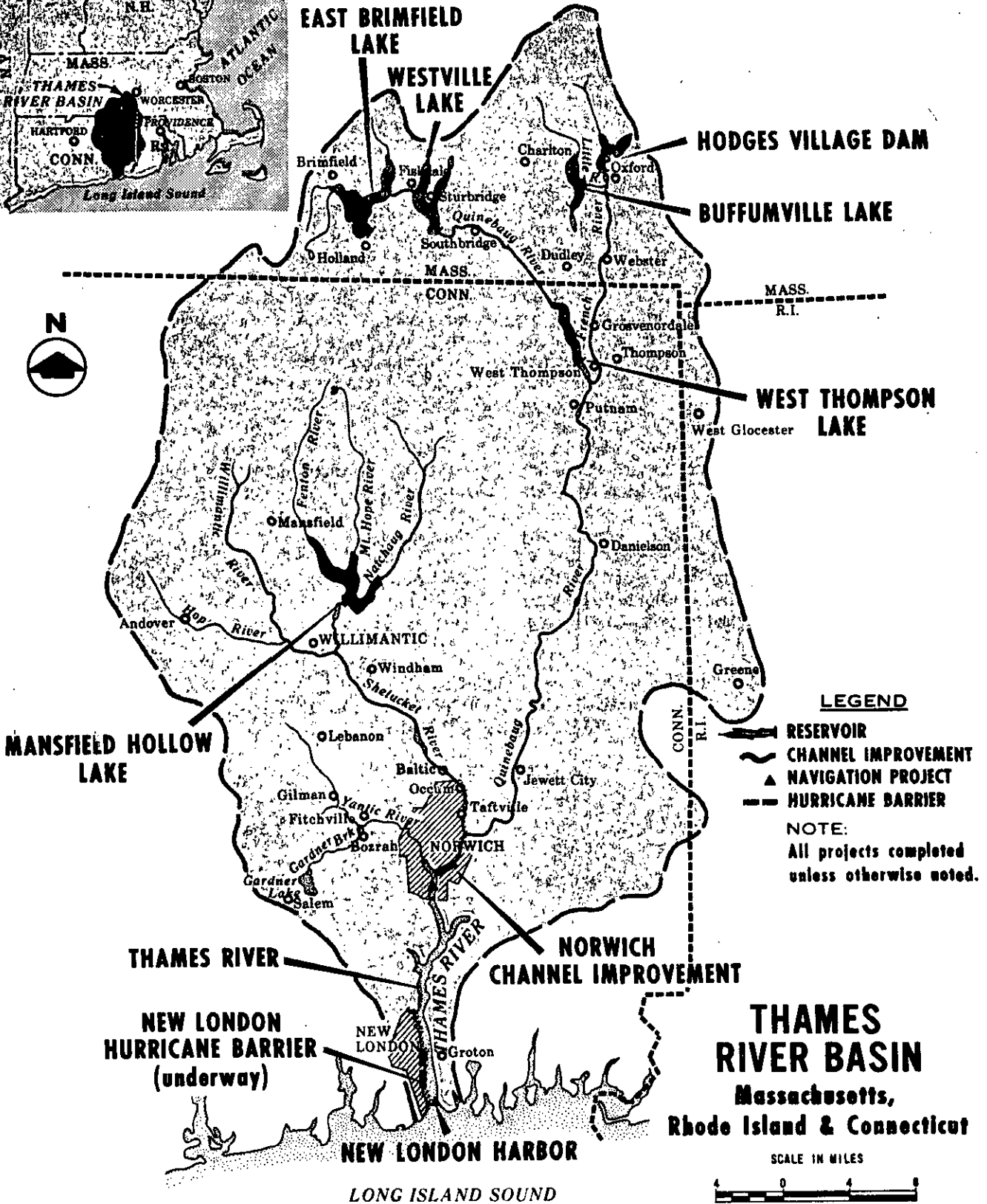
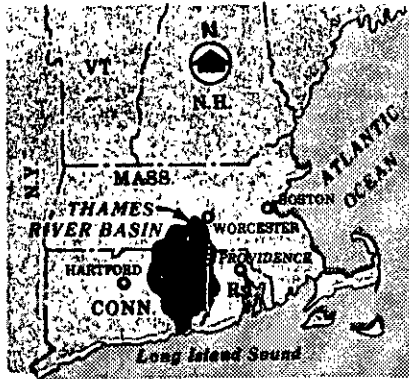
Mansfield Hollow Dam is a rolled-earth fill structure with a dumped rock blanket. Together with a concrete ogee spillway section, the dam and 6 dikes total about 15,000 feet in length with a maximum height of 68 feet. The top of the dam at elevation 273 feet above mean sea level (msl) is a paved access road.

The overflow concrete spillway is 690 feet long across the main stream with a crest elevation of 257 feet msl. Five gated rectangular conduits, three with inverts at elevation 199 feet msl and two with inverts at elevation 195 feet msl comprise the outlet works of the dam, located in the center of the spillway. Five 5-1/2' x 7' hydraulically operated slide gates control the flow through the outlet works. Concrete weirs upstream from the first two gates maintain the permanent lake at the required elevation of 211.5 feet msl in spring and summer and 205 feet msl in fall and winter.

2. Reservoir

The Mansfield Hollow Dam if filled to the spillway crest elevation has a storage capacity of 52,000 acre-feet, which is equivalent to 6.1 inches of runoff from the drainage area of 159 square miles. The full

NOTE: Delineation of streams on map is limited to major streams or to those having existing project or current study



reservoir would have a water surface area of 1880 acres and a maximum depth of 62 feet. At this elevation the reservoir would extend up the Natchaug River about 3.0 miles, Mount Hope River about 2.3 miles and the Fenton River about 3.2 miles. The recreation pool with a surface area of 450 acres, is maintained at elevation 211.5 feet msl from May 1 until Labor Day. Then it is lowered to elevation 205, with a surface area of 200 acres, until the following May 1.

3. Chapin Brook Dike

Part of the dam designated as dike "B", was built across Chapin Brook to prevent the reservoir from flooding Mansfield Center during high flood stages. A conduit through the dike allows the brook to flow into the Fenton River. If a storm occurs when the Mansfield Hollow Reservoir is 18 feet or more deep, the runoff would be stored behind the dike until the reservoir level dropped enough to allow discharge from Chapin Brook. This storage would form a reservoir of 520 acre feet at elevation 245 feet msl and 760 acre feet at elevation 250 feet msl. The dike outlet is a conduit 230 feet long with a sluice gate at the entrance at elevation 218 feet msl and a backwater gate at the exit at elevation 216 feet msl.

4. Real Estate

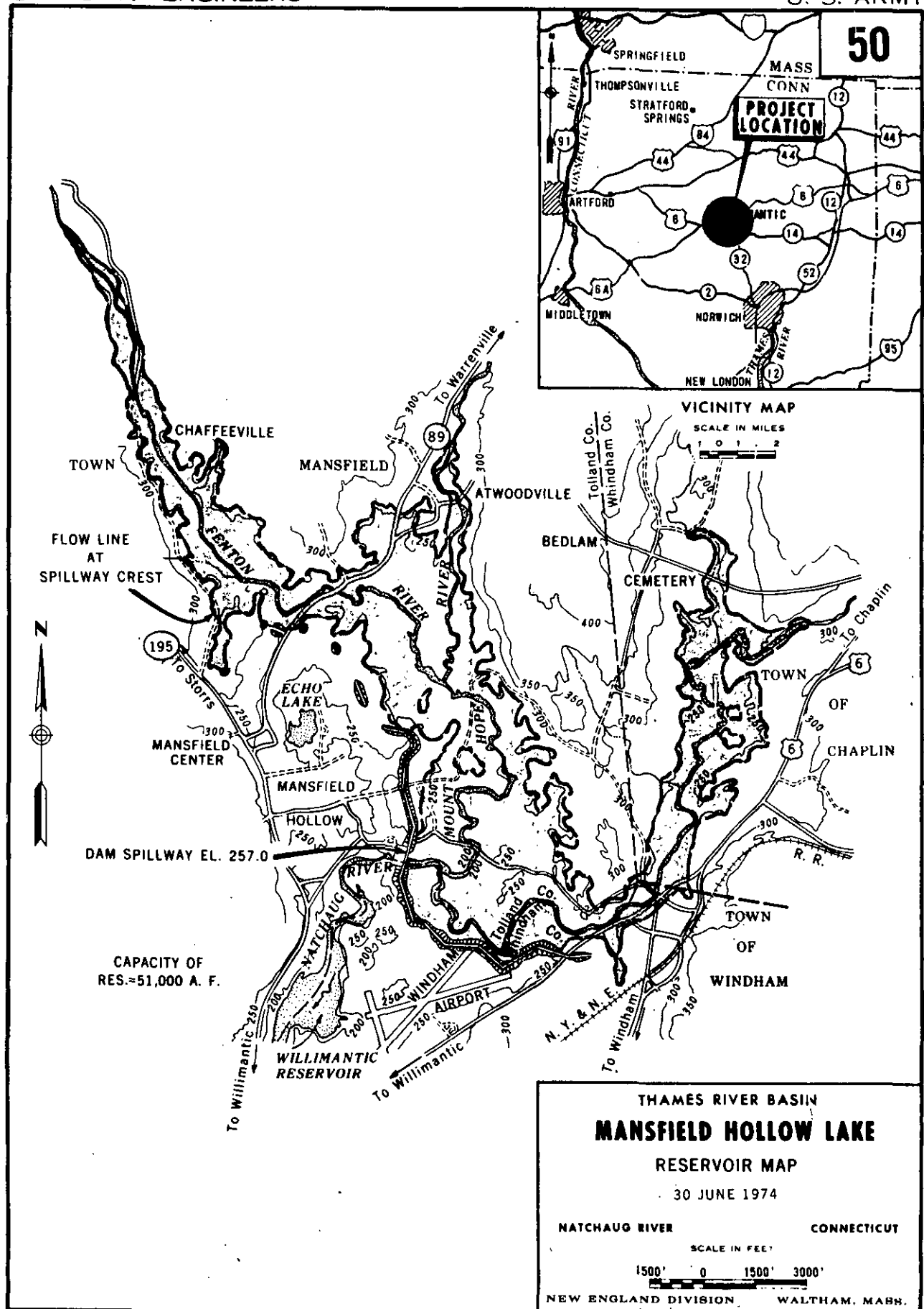
The project area contains a total of 2472 acres acquired in fee and 61 acres in flowage easement. The immediate area outside the project contains woodland, residential property, commercial enterprises, and a small airport. The reservoir area has been cleared to an elevation

18 feet above the base of the dam, or 1-1/2 feet above the level of the summer recreation pool, about 600 acres. The easement properties are southeast of the dam in the village of North Windham, the southwest corner of Chaplin, and the southeast corner of Mansfield, all consisting of small residential properties.

C. OPERATION PROCEDURES

Reservoir regulation at Mansfield Hollow Lake is coordinated with water level stages on the Willimantic and Shetucket Rivers. As part of the flood control program in the Thames River Basin, the Project Manager reports significant runoff potential in the form of rainfall and snowmelt to the Reservoir Control Center (RCC) in Waltham, Massachusetts. Reporting networks have been established in cooperation with the National Weather Service, the U.S. Geological Survey, and local authorities. Reports from network stations are received weekly during non-flood periods, and on demand during storms. Because of rapid runoff in the basin, data collection emphasis has been on river stage recording stations, especially at damage centers downstream of reservoirs, in order to provide prompt information on flood conditions.

Regulations of flow from the dam is initiated whenever the downstream channel capacity of the Natchaug and Shetucket Rivers might be exceeded. Regulation may be considered in three phases during the course of a flood: Phase I, the appraisal of storm and river conditions during the development of a potential flood, leading to initial flow regulation; Phase II, regulation of reservoir discharge to reduce



downstream flooding along the Natchaug and Shetucket Rivers, and Phase III, emptying the reservoir as rapidly and safely as possible following flood conditions.

D. MANAGEMENT PROGRAMS

1. Recreation

The State of Connecticut, Department of Environmental Protection leases 2,313 acres of the 2,472 total project acreage and manages the recreational facilities around Mansfield Hollow Lake. The recreation area on the west side of the lake above the flood encroachment lines has 50 picnic tables, 35 fireplaces, 4 comfort stations, and 2 playing fields. There is a boat launching ramp on the same side of the lake just above Bassett Bridge. The State supervises fishing, hunting, dog trials, and boating, and maintains the public access roads to its facilities. Swimming is not presently allowed because of the proximity of this project to the water supply distribution reservoir located 1/2 mile downstream.

The project is also occasionally utilized for other recreational activities by private groups. The Columbia Model Airplane Association has a mowed grass "runway" in the meadow northeast of the dam, and the Columbia Canoe Club holds races during the summer for which the Corps raises the recreation pool level to 212 feet msl, one foot above the summer pool.

2. Forestry

There is no management of the woodlands in the project for wood production. Some vegetation has been cleared for the picnic area and

ball field and the State of Connecticut is responsible for removing dead trees from around the edge of the permanent pool. The Corps mows the grass areas around the dam to prohibit tree growth which might interfere with maintenance and inspection of the dam.

3. Fish and Wildlife

Presently fish and wildlife management is conducted by the Connecticut Department of Environmental Protection under a 25 year lease. The State has a wildlife stocking program for pheasant and trout. Rainbow, Brook and Brown Trout are stocked in the Fenton, Mount Hope and Natchaug Rivers that empty from the north into Mansfield Hollow Lake. Approximately 600 pheasants are released every fall in the reservoir area.

The New England Field Dog and Kennel Club releases about 100 quail in the southeastern section of the Hollow for bird dog field training. These events are scheduled once in the spring and twice in the fall.

II. ENVIRONMENTAL SETTING

A. CLIMATE AND PRECIPITATION

The Thames River Basin, including the Natchaug subbasin and Mansfield Hollow Lake, has a variable climate characterized by frequent but short periods of heavy precipitation. The basin lies in the path of the "prevailing westerlies" and cyclonic disturbances that cross the country from the west or southwest to the east or northeast. The basin is also occasionally exposed to coastal storms, some of which

originate in the tropics and may be of hurricane intensity, heavily laden with moisture from the ocean.

The southern part of the Thames River Basin has a generally milder climate than the northern part, due to the influence of Long Island Sound. The average annual temperature in Mansfield near the dam is about 48°F. Average monthly temperatures range from about 70°F in July and August to 26°F in January and February. Air temperatures sometimes reach 100°F in summer and fall to -10°F or lower infrequently in winter.

The average annual precipitation over the Thames River basin is about 44 inches. During 8 years of record, snowfall at Mansfield Hollow Dam has averaged 43.4 inches, which is about 1 foot less than in northern parts of the basin. For the Thames River Basin as a whole, the average annual runoff is 22.5 inches (1.64 cfs per square mile) or just over 50 percent of the average annual precipitation.

B. TOPOGRAPHY

The Natchaug River is formed by the confluence of the Still River and Bigelow Brook south of Phoenixville, Connecticut, and flows southwestward to Mansfield Hollow Lake. During spring freshets, the river rises moderately, and summer flow is well sustained by rainfall and groundwater. Because of the generally hilly topography, runoff is fairly rapid throughout the Thames River basin.

The Natchaug River has a total fall of 267 feet along a total length of 16 miles. In the vicinity of the reservoir, the average slope is about 15 feet per mile. Hilly terrain with moderate relief

surrounds the reservoir area. The river valleys are narrow and steep-sided and are flanked by terraces and high hills. Parts of the narrow flood plains are swampy. The upper part of the reservoir inundates a former marsh and swamp. Elevations in the vicinity range from about 190 feet msl in the streambed at the dam to about 590 feet msl on a hill east of Chaffeeville overlooking the Fenton River.

C. VEGETATIVE COVER TYPES

About three-fourths of the land in the towns of Mansfield, Chaplin, and Windham is wooded, including about 50 percent of the reservoir area. Most of the woodlands vary in density and tree sizes, indicating recent regeneration following some previous use, such as agriculture or cutting. The predominant tree species in the flood plain and swamp woodlands is red maple, frequently accompanied by ironwood and white ash and occasionally gray birch, red oak, American elm, and sugar maple. The shrubby swamps of the reservoir consist largely of redosier dogwood, meadowsweet, steplebush, speckled alder and black alder. The herbaceous plants of marshes and wet meadows are tussock sedge and other sedges, grasses, rushes, and ferns. The upland woods in the reservoir area occur mostly on dry sandy soil and consist predominantly of red oak, white oak, and white pine.

D. FISH AND WILDLIFE SPECIES PRESENT

Mansfield Hollow has been for many years a mecca for local professional and amateur naturalists and biologists, which indicates the value of this area as wildlife habitat. Major wildlife species present

are cottontail rabbits, grey squirrel, skunk, opossum, vole, mice and other rodents. Game birds such as black duck, mallard, Canada geese, grouse, and pheasant also can be found.

The non-game birds inhabiting this area include osprey, red-tail hawk, common loon, herring gull, cattle egret, migrating shorebirds, mocking bird, cardinal, and wintering sparrows and finches. The golden plover is one of the rare shorebirds which visit the reservoir.

Among the cold-blooded species to be seen are snapping, painted and spotted turtles, water snake, milksnake, garter snake, hognose and green snakes. Amphibians include bull frog, green frog, leopard frog, red-backed salamander and newt. Fishing is a great attraction to Mansfield Hollow. Trout stocked rivers are located just north and east and other fish species found in the lake are bluegill, shiner, bass, yellow perch and chain pickerel.

E. GEOLOGICAL FEATURES

The bedrock underlying the dam and reservoir area is metamorphic gneisses and schists with pegmatite intrusions. Natchaug, Fenton and Mount Hope Rivers flow mostly over alluvium composed of silt, sand, and gravel, although for short distances the Natchaug and Mount Hope rivers flow through narrow valleys in bedrock and in the terraces of glacial drift that line all three steep-sided river valleys. These terraces are the only flat areas above the flood plain and therefore are used in preference to other parts of this predominantly hilly area for most recreation activities.

Almost the entire reservoir area, except around the permanent pool below Bassetts Bridge, is underlain by extremely productive aquifers. The U.S. Geological Survey estimates that wells in these aquifers could yield up to several million gallons per day.

F. SOCIO-ECONOMIC CONDITIONS

The Natchaug River basin is rural, the only center of industry being the city of Willimantic. Most of the basin is abandoned farmland which has become wooded.

The city of Willimantic had a population of 14,600 in 1970 and is not expected to increase significantly in the next few years, unless Interstate 84 is completed and brings in new industry. People from surrounding towns, as well as city residents, work in the city. The two largest industries in the city are American Thread Company, which manufactures thread and yarn; and Brand Rex, which makes wire and cable. Each of these firms employs about 1,000 people. Just outside the city of Willimantic is another large industry, Kendall Corporation, a subsidiary of Colgate-Palmolive.

The town of Mansfield had a population of 19,994 people in 1970 but has since declined slightly. The economic mainstay of Mansfield is the University of Connecticut at Storrs, which has an enrollment of over 17,000 students.

III. ENVIRONMENTAL IMPACT OF THE OPERATION MAINTENANCE, AND MANAGEMENT PROGRAM

A. OPERATION FOR AUTHORIZED PURPOSES

1. Downstream Effects

a. Flooding Prevented

Since completion, Mansfield Hollow Lake has been responsible for preventing estimated losses of \$5,388,000. The flood of record in the Thames River Basin occurred in August, 1955, caused by the torrential rains of Hurricane Diane and resulting in damages of an estimated \$62 million and 8 lives lost. In conjunction with the Norwich channel, the dam prevented downstream losses of \$4,300,000 during this storm.

Maximum storage occurred during the 1955 flood when Mansfield Hollow Lake was filled to 52 feet above the streambed, or about 65% of capacity. The peak regulated outflow was 2800 cfs, whereas the maximum inflow was 16,000 cfs. The stored floodwaters covered a total of 1,450 acres.

b. Fish and Wildlife

The regulation of river flows to protect developed areas downstream unavoidably prevents or reduces flooding of natural flood plains, where seasonal or periodic inundation is known to be beneficial from the standpoint of groundwater recharge and the maintenance of ecological diversity and productivity.

When natural flooding is reduced due to dam and reservoir operations, some alteration of aquatic and terrestrial ecosystems will occur downstream. Artificially modified flood patterns below Mansfield Hollow Dam may have decreased the amount of area flooded so that there may be less aquatic productivity there than before dam construction. Wetlands, even temporary ones, are important to the life cycles and habits of many species of wildlife, waterfowl, and fish. They promote insect production and diversity of vegetation which in turn supply food for a variety of fish and birds. Modification of these areas may adversely affect the entire food chain of wildlife species, from aquatic invertebrates to spawning fish. Thus, the net downstream result of the dam may be the same as the upstream effect: decreased aquatic productivity. Downstream, however, areas no longer flooded can become terrestrial wildlife habitat if not developed.

c. Vegetative Cover and Timber

A direct result of flood control operations is a decreased frequency of bank overflow downstream from the reservoir. Of the area where these effects occur below Mansfield Hollow Dam, over 50 percent is developed, cultivated, or flooded by the Willimantic Reservoir. Over half of the undeveloped land downstream slopes steeply to the river and thus was flooded only rarely and briefly before dam construction. The change in flow regimen caused by the dam has not noticeably affected the species composition of these woodlands.

The species composition of the woodland canopy has not changed noticeably, because most lowland trees can tolerate a range of soil moisture conditions.

2. Upstream Effects

a. Fish and Wildlife

Mansfield Hollow Dam to date has had no major detrimental effects on wildlife. The most diverse habitat is north of the Bassett's Bridge Road. The effect of flood storage and spring raising of the pool level on the area may be critical during the breeding season. For example, during May and June marsh-nesting birds are rearing young. At this particular time, insectivorous birds are highly dependent on a steady insect population in the marsh. Emerging aquatic insects are consumed by many birds as well as mammals, reptiles, amphibians, and other insects. Any unnatural change in the water level could affect the breeding success of the lake and marsh ecosystems. In the event of a summer time flood control operation, very young wildlife could be killed, but older animals of breeding age would have little trouble escaping the rising floodwaters.

b. Vegetative Cover and Timber

The permanent pool covers 450 acres at the summer water surface elevation of 211.5 feet msl maintained from 1 May until Labor Day and 200 acres at elevation 205 the rest of the year. The fall lowering of the water level exposes mudflats that are productive for shorebirds. However, some visitors to the reservoir may consider the flats unsightly

because the lowered level exposes the stumps of dead trees and other organic debris. The annual fluctuation in water level prevents the establishment of the typical zones of vegetation around lake and pond edges. Instead, there is a narrow bank of wetland shrubs and herbs containing scattered red maples and dead trunks of their tree species.

The lake is almost entirely surrounded by well-drained glacial terraces with upland vegetation and steep slopes to the water. Therefore, only the rarest floods will inundate large areas of normally dry forest. Flood waters would probably do very little damage to these woods because the reservoir would be lowered to premanent pool level as soon as possible after a flood and because the sandy soil will drain quickly.

The effects of flooding on plants depend in part on the season of the flood. Late winter and early spring floods are less likely than summer floods to kill plants by oxygen starvation of the flooded roots because the plants are dormant until early spring. Mansfield Hollow Lake has been in operation long enough that the plant species composition of the frequently flooded low areas has adjusted to the change from flood plain to lake. The largest flood which has occurred since dam construction (August 1955) killed and damaged many more plants because it occurred during the growing season when the susceptibility of plants to flood damages is greatest.

Another major flood could again damage vegetation and would leave debris in the reservoir area. However, rain will wash the mud off of plants, and damaged vegetation will produce new leaves immediately except in late summer and fall. Absence of human interference will encourage the establishment and survival of plants that can tolerate prevailing conditions.

c. Recreational Use

Recreational use of Mansfield Hollow Lake is necessarily subordinate to authorized flood control operations and occasionally is reduced by them. The playing field and much of the picnic area are not in conflict with flood control because they are above the spillway crest elevation. However, the boat launching area, the dog trial area, and hiking trails are within the potential flood pool.

Bassett Bridge Road must be closed when the pool depth is 25 feet at the dam, because it is flooded at a reservoir stage of 29 feet. One abandoned access road is flooded almost every spring. North Windham Road and a second abandoned road are flooded with moderate frequency at stages 40 feet and 33 feet, respectively. The boat launching area is also flooded frequently. These conditions may interfere with early season trout fishing. The State of Connecticut is responsible for flood inspection, cleanup and repair of flooded facilities in the leased area. Cleanup following a large storm and significant flood storage has, in some cases, required considerable time, during which recreation may be restricted to allow for work in the reservoir.

d. Water Quality

The Natchaug, Mount Hope and Fenton Rivers, upstream of Mansfield Hollow Dam are Class AA waters. The confluence of these three rivers is in the Mansfield Hollow Reservoir area. Immediately downstream of the project is Willimantic Reservoir, an impoundment along the Natchaug River which is used as the water supply for the city of Willimantic, Connecticut. Class AA water is of uniformly excellent character and is suitable for water supply and all other water uses. Dissolved oxygen concentrations must always be at least 5 mg/l and 75 percent saturated 16 hours per day. Total coliform bacteria levels must not exceed a median of 100 colonies per 100 ml nor more than 500 colonies per 100 ml in more than 10 percent of the samples collected.

The New England Division has been periodically collecting water quality samples in the reservoir area since 1971.

To date, the mean dissolved oxygen concentrations of samples taken from the Mount Hope River, immediately downstream of its confluence with the Fenton River, is 9.0 mg/l while the mean concentration in the Natchaug River, in the reservoir area, is also 9.0 mg/l. The mean dissolved oxygen concentration of water discharged from the project is 8.8 mg/l. Water stored in the lower levels of the 17 foot deep impoundment may be consuming some of oxygen in the water. However, the difference between the inflow mean of 9.0 mg/l and the discharge mean of 8.8 mg/l indicates that any consumption is insignificant. The policy of drawing water from the bottom of the reservoir, as well as the top of the weirs, reduces the oxygen depletion in the reservoir.

Total coliform bacteria measurements at the project are irregular. To date, only 3 measurements have been obtained in the reservoir area and three measurements immediately downstream of the project. Five of the six results do not meet the State stream standard of 100 colonies/100 ml. Those data exceeding Class AA standards range from 210 to 2,500 colonies per 100 ml.

Periodic measurements of oxidizable organic material, chlorides and total phosphates indicate that abnormally high concentrations of these constituents occasionally occur.

Flood control operations affect the quality of water in the reservoir in a number of ways. The annual raising and lowering of the permanent pool at Mansfield Hollow has the beneficial effect of leaching nutrients from the lake edges. The nutrients are carried into deeper water where aquatic weeds are not as likely to become established. In this way the rate of natural eutrophication is decreased. However, at the same time, the biological productivity of the lake is low, because the annual water level fluctuation is so large that near-shore aquatic ecosystems cannot become established. The drastic change in water level, rather than freezing of roots during winter exposure, is the reason that aquatic weeds are not a serious problem at this reservoir.

e. Aesthetics

A flood control reservoir after drawdown of the flood pool can be unsightly. Mud, debris and dead vegetation are the more adverse aesthetic effects. Little can usually be done to improve the major part of the project after flooding because of the large areas of land involved.

At Mansfield Hollow Lake the most heavily visited places are the boat launching area, picnic area and dam. Since the picnic area is outside the flood encroachment area, it is not affected by flood debris. The State of Connecticut is responsible for cleaning and maintaining the boat ramp. Fairly large areas of the project can be seen from the shores of the reservoir and from the dam so that flood effects are highly visible.

Mansfield Hollow Lake was filled to 52 feet above the base of the dam during the 1955 flood. If filled to capacity, it would extend about 2 miles upstream on the Natchaug River and 2-1/2 miles on the Fenton. The destruction of vegetation and deposition of debris during flood control operations along these valleys as well as around the lake could create a temporary adverse aesthetic effect.

At the time of project construction, about 600 acres were cleared for the pool to about 1-1/2 feet above its summer level. Shrubs and herbs now extend to the level of the summer pool, so that the muddy lake bottom is exposed only during the fall and winter.

f. Agricultural Activities

The Corps leases a total of 318 acres to several individuals for raising hay and corn. No livestock grazing is allowed in the reservoir area. The potential economic impacts of flooding include delayed planting from spring flooding and crop damage at any time during the growing season. The Corps reservoir drawdown policy will keep agricultural flooding as brief as flood conditions will allow.

The lessees use no pesticides or chemical fertilizers that could contaminate floodwaters or ground water.

B. OPERATION AND MAINTENANCE OF PROJECT FACILITIES

1. Recreational Facilities

The Connecticut Department of Environmental Protection is responsible for all routine maintenance of the recreation facilities.

These activities include mowing in the playing field, cleaning and repair of picnic facilities, and collection of trash. The picnic area has flush toilets with a septic tank and leach field. The septic tank must be cleaned out every two years. The leach field cannot be flooded because it is above the maximum flood pool.

The picnic area is on the wooded terrace and slopes above the reservoir in a natural setting. The trees and understory vegetation are healthy and attractive. The understory provides habitat for birds and small animals, which also contribute to visitors' aesthetic enjoyment. The unaltered, hilly nature of the picnic area is an additional source of visual aesthetic appeal.

The boat launching area by Bassett Bridge includes an unpaved parking lot. This area can be flooded rather frequently and may thus require periodic regrading.

2. Sewage and Solid Waste Disposal

Rest rooms with chemical toilets were installed during construction of the picnic area, while portable chemical toilets are provided at the boat launching ramp and the dog trial field. The rest rooms at the picnic area have been converted to flush toilets with a septic tank.

The State Park Manager assigned to Mansfield Hollow by the Connecticut D.E.P. is responsible for disposal of trash and litter and for clean-up of flood debris on the leased part of the project. The Corp's Project Manager is responsible for post-flood clean-up on the unleased acreage.

3. Plant and Insect Pest Control

Most of Mansfield Hollow Reservoir consists of unimproved land not actively managed for recreation or other purposes and requiring only minimum maintenance. Plants that grow spontaneously on the riprapped dikes are sprayed with Ammate X, the only herbicide which the State of Connecticut D.E.P. allows because of the downstream use for public water supply. No further weed or brush control and no insect control is undertaken at Mansfield Hollow Lake. Aquatic weeds are not a problem in the lake and the annual raising and lowering of the pool may be helping to keep them from becoming well established.

C. MANAGEMENT OF PROJECT LANDS

The most difficult aspect of managing public land for recreation is preventing abuse and resolving conflicts in uses. The facilities for intensive public use are now concentrated in one place on the west side of the lake beside Bassetts Bridge Road. This concentration makes it easier to monitor recreational activities. The entire reservoir, except for facilities associated with operation of the dam, is open to the public free of charge, although use of most of it is less intensive than of the picnic area, playing field, and boat launch. The

only restriction to public access is the closing of low-lying roads when flooding is imminent.

The Corps completed a survey of the boundaries of publicly owned and easement land in 1976. Signs have been placed at the dam and recreation area describing the project, its public nature, and the responsible public agencies.

Although over 130,000 visitors have come to Mansfield Hollow State Park each of the past nine years, the facilities in general, do not appear overused. Part of the reason may be that the total number of visitors includes a large proportion of people who come just to look at the dam and do not use other facilities. There are trails through the picnic area and to a nearby marsh and the boat launching area. The picnic tables are in the woods on the terrace and the natural slopes above the lake, so that much of the natural character of the site remains. The ground cover except on trails is natural plant litter.

Trail bike riding has occurred on some dikes and a borrow area within the reservoir. These vehicles have created slope erosion and noise problems and are forbidden throughout the project. If trail bikes continue to use other parts of the reservoir, they have the potential for destruction of vegetation and soil and for annoyance of wildlife and pedestrain park users.

At present, there is no active forest management on the Mansfield Hollow project, and a number of conditions make forest management

impractical. The flats around the reservoir are flooded frequently, and create unfavorable conditions for good growth of the customarily planted species. Most of the higher ground in the reservoir area is already rather highly productive semi-open woods and shrubby meadow, except around the dam and recreation area. A few rows of red pine have been planted in the field just northeast of the dam.

IV. ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED AS A RESULT OF THE OPERATION, MAINTENANCE, AND MANAGEMENT PROGRAM

A. WATER QUALITY

With the establishment of a conservation pool behind Mansfield Hollow Dam, a 12,400 foot long reach of the Mount Hope River was altered from a running water to a standing water environment, thus modifying some of the physiochemical dynamics affecting the water. The necessary practice of raising and lowering the pool level according to downstream flooding potential precludes the establishment of stable communities of rooted aquatic plants and thereby results in low aquatic productivity.

B. VEGETATIVE COVER AND TIMBER

Flood control operations at the Mansfield Hollow Dam have the potential to damage the vegetation in the reservoir. The adverse effects will vary with both the extent and duration of flood water impoundments, and some losses of vegetation are unavoidable. The standard reservoir regulation procedures prescribe that emptying of the reservoir should begin as soon as the flood levels begin to

recede at specified downstream checkpoints. In this way flood waters are impounded for the shortest possible time with the least possible damage to vegetation.

V. ALTERNATIVES TO THE OPERATION, MAINTENANCE AND MANAGEMENT PROGRAM

A. DISCONTINUANCE OF AUTHORIZED FLOOD CONTROL OPERATION

If the Mansfield Hollow Dam ceased operation, there would be no artificial flood storage capacity in the Shetucket branch of the Thames River Basin. Large floods would severely jeopardize the Willimantic Reservoir and the city of Willimantic and other downstream developments in the flood plain. Discontinuance of flood control is not economically sensible and would not occur unless all development in the downstream flood prone areas are removed and future development prohibited.

B. LAND MANAGEMENT ALTERNATIVES

The Corps of Engineers' policy in managing its reservoirs is to allow for optimum public use consistent with flood control objectives. However, the various types of management programs suitable for a given project depend in part on such factors as: geographic location; topography; frequency, duration and extent of reservoir flooding; supply of and demand for various forms of land and water oriented recreation; and compatibility of different land and water uses with one another. These physical constraints will determine the suitability of an area for one use alone or for many coexisting uses which can be

managed simultaneously. The presence of large contiguous areas of Government owned property and the absence of heavy human development are conducive to intensive wildlife management. Thus, the Wildlife Unit of the Connecticut Department of Environmental Protection, which is responsible for such management, encourages hunting by stocking the reservoir with game birds and by allowing field dog trials.

a. The Thames River watershed in northeastern Connecticut is becoming an increasingly popular recreation area for densely populated Southern New England. Mansfield Hollow Lake represents one of the largest areas in Connecticut that is maintained as undeveloped land and which can be preserved in this state for the future.

The forest resources of Mansfield Hollow Reservoir are not suitable for good timber production, because of the steep slopes and sandy soil which is poor and dry. However, the woodlands in their present semi-open condition with small to medium-sized trees are excellent general wildlife habitat and could be managed to continue as such. Although most of the property outside the existing and proposed recreation areas is too steep or wet to clear and plant with perennial grasses and annual grain crops, occasional selective thinning would perpetuate existing openings in the canopy and encourage shrubs and tree seedlings which are good wildlife food.

The public's recreational demand and the natural resources of Mansfield Hollow Reservoir are the primary reasons for continuing multiple rather than single purpose use of this public property.

Because this land must be left undeveloped for flood storage, it is preserved from potential conversion to more profitable uses. Since it is being managed as natural open space, its use for recreation and conservation is compatible with flood control objectives.

C. OPERATION AND MAINTENANCE ALTERNATIVES - RECREATION

Section 4 of the 1944 Flood Control Act (Public Law 534, 78th Congress) authorized the construction, maintenance, and operation of public park and recreational facilities at flood control reservoirs. Since that time part of the Corps' responsibility has been to make provisions for various recreational uses compatible with primary flood control objectives. The large numbers of users of Mansfield Hollow State Park indicates that the recreational opportunities offered are popular and needed. Therefore, the discontinuance of operation and maintenance of the park's recreational facilities would deprive users of recreational opportunities and probably create greater pressure and, perhaps, environmental stress on other public lands. Furthermore, the reservoir property below Bassett Bridge where most recreation facilities and activity occur now, has less natural environmental value than the rest of the area. Therefore, wildlife and aquatic life would not benefit as much from abandonment of recreation below Bassett Bridge as from the creation of a sanctuary above it and in the normally non-flooded part of the Natchaug River Valley. Recreation is probably the best use of the resources of the lower part of the lake, its shores, and the surrounding terraces.

Leaving the rest of the project undisturbed for the benefit of wildlife and plants would maintain the present balance on the property between undeveloped open space and relatively high intensity recreation, thus responding to the necessity for both. This course of action is also prudent, because most of the undeveloped land is unsuitable for man-made facilities, either topographically or geographically.

VI. THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Most flood control projects have been developed in response to a publicly determined need to protect valuable land uses from harmful flooding. Usually the response has occurred after some critically damaging flood, which made the need appear more urgent at the time. In these cases, hindsight tells us exactly where flood control is necessary and to what extent.

The only short-term use of the environment that has occurred so far is the use of materials for dam construction. Since the dam is projected to last 100 to 200 years its economic benefits can be considered long-term. With the exception of natural areas eliminated at the dam site and for the recreational facilities, the operation of the dam has not eliminated biological productivity, but has substituted one set of natural habitats for another.

The city of Willimantic has industrial and commercial enterprises, and residences in the Natchaug River and Willimantic River flood plains.

This past development eliminated natural flood storage areas, reduced the river's hydraulic efficiency, and resulted in construction directly in the path of floods. Yet such development has been economically beneficial to the communities. Therefore, the flood protection offered by Mansfield Hollow Dam may contribute to the city's continued economic stability and the region's long-term economic productivity.

The dams in the Thames River Basin were designed to protect development already in the flood plain and not necessarily new construction. Unfortunately, communities below the Mansfield Hollow Dam have generally made no plans to limit further flood-plain development or otherwise regulate flood-plain use to be consistent with the river's hydraulic efficiency and with ecological goals. Methods of long-term environmental planning are being developed to deal with the above problems, but in many cases clear channels for implementation and/or enforcement have yet to be defined.

Mansfield Hollow Lake and State Park have met some of the local and regional demand for several kinds of recreation: picnicking, team sports, boating, hunting, fishing, hiking, and enjoyment of natural scenery. The continued provision of these recreational opportunities is a long-term benefit which will last as long as maintenance of the dam and recreational facilities. It will help to meet the projected demand for the available forms of recreation.

VII. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES INVOLVED IN THE OPERATION AND MAINTENANCE PROGRAM

In addition to the 600 acres of vegetation removed or drowned in formation of the permanent pool, there has been damage to vegetation from flooding. Flood-intolerant tree species near the edge of the reservoir have died, and vegetation at higher elevations was damaged and killed in the 1955 flood. Frequent flooding has caused changes in the plant species composition of the lake shores. An average of 100 acres or more above the summer pool will remain in a state of continual recovery from the effects of approximately annual flooding.

Wildlife within the reservoir also suffers from flood control operations. At the time of construction, most of the 2472 acre project was farmland or woodland and meadow and supported a variety of terrestrial animal species. Along with the loss of terrestrial habitat in the permanent pool, there probably were and are some direct losses from drowning.

Large floods have disrupted and dispersed fish populations, their spawning and their food sources. The general instability of the environment for a stream fishery in the most frequently flooded parts of the rivers within the reservoir constitutes an irreversible compromise of the quality of that resource, along with a degree of irreparable loss.

VIII. COORDINATION WITH OTHER AGENCIES

Coordination with the Connecticut Department of Environmental Protection resulted in valuable input to this assessment. Meetings and correspondence as well as reports, suggestions, and research data proved to be very helpful.


Upon evaluating the material presented in this Environmental Assessment, it is my belief that continued operation, maintenance and management of the Mansfield Hollow Lake flood control project is in the best public interest. To discontinue operation of this project could cause serious flooding downstream of the dam with significant property damage. Public recreation opportunities provided at the project would also be lost if management of the area ceased.

Environmentally, the operation, maintenance and management of Mansfield Hollow Lake has only a minor impact. The downstream aquatic and terrestrial ecosystems have been altered somewhat due to reduced natural flooding. Impoundment of flood waters in the reservoir has minimal effects on fish reproduction, wildlife habitat and vegetation since the duration of inundation is usually rather short and often at non-critical times of year.

Therefore, since the environmental impacts of continued operation, maintenance and management of the Mansfield Hollow Lake Flood Control Reservoir are minor, a formal environmental statement is not required under the provisions of the National Environmental Policy Act of 1969.

It is my opinion that the public will best be served by continuing operation of Mansfield Hollow Lake.

31 March 1977
(date)


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